

Page 4, last line, insert the following paragraph:

While the foregoing description and drawings represent the preferred embodiments of the present invention, it will be obvious to one skilled in the art that various changes and modifications may be made therein without departing from the true spirit and scope of the present invention.

IN THE CLAIMS:

Page 5, before "1." change "Claims" to -What is claimed is-

Please cancel claims 1-23 and add new claims 24-46 reading as follows:

-24. A device for coupling a short pulse laser into a microscope beam path comprising:

a dispersive element for spatially separating the spectral components of the laser radiation;

means for manipulating individual spectral components; and

another dispersive element for spatially superimposing the manipulated individual spectral components.

25. The device for coupling a short pulse laser into a microscope beam path according to claim 24, wherein said manipulating means acts to manipulate components.

26. The device according to claim 24, wherein, after manipulation, the spectral components are reflected at a mirror and superimposed again by the dispersive element.

27. The device according to claim 24, wherein the microscope is a laser scanning microscope.

28. The device according to claim 24, wherein the microscope is used for investigation of nonlinear contrast methods.

29. The device according to claim 24, wherein prisms or gratings are used as dispersive elements.

30. The device according to claim 24, wherein the manipulator means generates an amplitude modulation of the spectral components.

31. The device according to claim 24, wherein the manipulator means generates a phase modulation of the spectral components.

32. The device according to claim 24, wherein the device is followed by a single-mode fiber F for coupling in a short pulse laser.

33. The device according to claim 24, wherein the single-mode fiber is also polarization-preserving.

34. The device according to claim 24, wherein a spatial light modulator is used in the Fourier plane as a manipulator means.

35. The device according to claim 24, wherein the manipulator means is purposefully optimized by feeding back the measurement signal and the desired measurement signal is therefore adjusted.

36. The device according to claim 31, wherein the phase modulation in the manipulator means is used to compensate higher-order dispersion by the use of the feedback.

37. The device according to claim 31, wherein the phase modulation in the manipulator means is optimized depending on the center wavelength of the short pulse laser by the use of feedback.

38. The device according to claim 31, wherein the phase modulation in the manipulator means is optimized depending on the utilized objective by the use of the feedback.

39. The device according to claim 31, wherein the phase modulation in the manipulator means is optimized depending on the utilized average output by the use of feedback.

40. The device according to claim 31, wherein, by the use of feedback, the phase modulation in the manipulator means is adjusted depending on the depth of penetration into a preparation to be examined and a nonlinearly excited fluorescence signal is therefore optimized.

41. The device according to claim 24, wherein the pulse front and the spherical aberration are optimized additionally by an adaptive element AO.

42. The device according to claim 31, wherein the phase modulation in the manipulator means is optimized depending on the utilized objective by the use of feedback.

43. The device according to claim 24, wherein a specific excitation of